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Special Provision for Articulated Block Revetment Mat

September 27, 2002

This special provision was developed by the Bureau of Materials & Physical Research and the Bureau of Design & Environment to provide material requirements for articulated block revetment mat and disregard conflicting information between Articles 281.04(e), 285.06, 1005.02(e) and 1081.12 of the Standard Specifications. This special provision should be inserted into all contracts using articulated block revetment mat.

Designer Notes:

(a) Based upon hydraulic analysis, the designer must specify the following information on the plans:

    (1) The size and mass (weight) of the blocks.
    (2) The frequency and depth of mat anchors.
    (3) Whether the configuration of the mat is open-cell (has voids) or closed-cell (solid surface).

(b) Based upon aesthetics, the designer must decide if the finished mat is to be seeded. Topsoil and seeding are separate items of work and are not addressed herein.

The districts should include the BDE Check Sheet marked with the applicable special provisions for the January 17, 2003 and subsequent lettings. The Project Development and Implementation Section will include the paper copy in the contract.

This special provision will be available on the transfer directory September 27, 2002.

80093m

ARTICULATED BLOCK REVETMENT MAT (BDE)

Effective: January 1, 2003

Description. This work shall consist of furnishing and placing articulated block revetment mat.

Materials. Materials shall meet the requirements of the following Articles of Section 1000 of the Standard Specifications:

Item	Article/Section
(a) Portland or Blended Hydraulic Cement	1001.01
(b) Water	1002
(c) Fine Aggregate	1003.02
(d) Coarse Aggregate (Note 1)	1004.02
(e) Fly Ash	1010.01, 1010.03
(f) Hydrated Lime (Note 2)	
(g) Ground Granulated Blast-Furnace Slag	1016
(h) Filter Fabric	1080.03
(i) Cable, Anchors and Fittings (Note 3)	

Note 1. Chert gravel may be used based on past, satisfactory, in-service performance.

Note 2. Hydrated lime shall conform to the requirements of ASTM C 207.

Note 3. Cable, anchors and fittings, such as sleeves, clamps and stops, shall be corrosion resistant and according to the manufacturer's specifications.

The block size, block mass (weight) and mat configuration (open-cell or closed-cell) shall be as specified on the plans.

Physical Properties. Physical properties of the blocks shall conform to the following:

Minimum Compressive Strength, kPa (psi)[1/]		Maximum Water Absorption, kg/cu m (lb/cu ft) (ASTM C 140)		Minimum Density (in air), kg/cu m (lb/cu ft)	
Average of 3 Units	Individual Unit	Average of 3 Units	Individual Unit	Average of 3 Units	Individual Unit
27,500 (4000)	24,000 (3500)	145.8 (9.1)	187.4 (11.7)	2082 (130)	2002 (125)

1/ For precast concrete block produced by the wet-cast method, compressive strength shall be determined according to Article 1020.09 of the Standard Specifications, or AASHTO T 24. For precast concrete block produced by the dry-cast method, compressive strength shall be determined according to ASTM C 140.

For precast concrete block produced by the wet-cast method, the air content shall be between 5.0 and 8.0 percent and determined according to Article 1020.08 of the Standard Specifications.

Freeze/Thaw Durability. Testing shall be according to either ASTM C 67 or ASTM C 1262.

(a) ASTM C 67. Specimens shall have no breakage and not greater than 1.0 percent loss in dry mass (weight) of any individual unit when subjected to 50 cycles of freezing and thawing.

(b) ASTM C 1262. Specimens shall comply with either of the following:

(1) The mass (weight) loss of each of five test specimens at the conclusion of 100 cycles shall not exceed 1 percent of its initial mass (weight).

(2) The mass (weight) loss of each of four of the five test specimens at the conclusion of 150 cycles shall not exceed 1.5 percent of its initial mass (weight).

Equipment. Equipment used to lift and place the mats shall be approved by the Engineer.

CONSTRUCTION REQUIREMENTS

General. The surface to be protected shall be graded to the lines shown on the plans such that it is stable in the absence of erosive forces and shall be prepared according to Article 282.04 of the Standard Specifications.

Filter Fabric. Filter fabric shall be installed according to Section 282 of the Standard Specifications prior to placing the articulated block revetment mat or it may be secured to the bottom of the mat according to the manufacturer's specifications and installed concurrently.

Placement. Normally, placement of the mats shall begin at the downstream end and proceed upstream. At side slopes, placement shall begin at the toe and proceed up. The upstream and outside edges of the mat shall be trenched at least one block deep and backfilled. The downstream edge shall be flush with the existing ground.

As mats are placed, they shall be anchored at the frequency and depth shown on the plans. If required by the manufacturer, adjacent mats shall be clamped or crimped together as well.

After placement of the mats, the voids in and around the blocks shall be filled with soil meeting the approval of the Engineer.

Excessive openings between mats shall be filled with Class SI concrete as directed by the Engineer.

Method of Measurement. This work will be measured for payment in place and the area computed in square meters (square yards). The portion of the mat in trenches will not be measured.

Filter fabric will be measured for payment according to Article 282.08 of the Standard Specifications.

Basis of Payment. This work will be paid for at the contract unit price per square meter (square yard) for ARTICULATED BLOCK MAT.

Filter fabric will be paid for according to Article 282.09 of the Standard Specifications.

Filling excessive openings between mats with Class SI concrete will be paid for according to Article 109.04 of the Standard Specifications.

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